However, it is unnecessary for us to deal further with the anomalies of the present system. Enough has been said to show that we are in full general agreement with the views expressed in the letter to the Press of April 19, and by the deputation of last July (see Nature, July 30 and August 6, 1908). We do not pin our faith to any particular treatment of the problem. That can only be done after a full inquiry by a Royal Commission, which we sincerely hope will be granted. The suggestions we have offered have been made more with the view of bringing out the most important of the points at issue than with that of laying down the law as to their treatment.

In saying what we have said we are deeply impressed with the great importance of the Natural History Museum to science and to education. Not only is it a most important means of scientific organisation and of research into problems which have an intimate bearing on human welfare and happiness, but, to quote the words of Sir Michael Foster in his admirable article on the museum in the *Quarterly Review* for 1906, p. 496:—

> "It has other uses as well. The museum belongs to the people; it is supported by the people's money; and it is only right that some benefit to the people more direct than that yielded by abstract science should come from it. And great direct benefit can, with some little administrative care, be got from it for the people. In this dull life of ours, above all in this dull city of ours, with its murky surroundings, it is no small thing that an easy stroll, without fee, should bring the dweller in slum alley and unlovely street face to face with the countless beauties of the animal creation; and much of the animal world is beautiful even in death. It is perhaps even a greater thing that, as is clearly shown by what has been done in the past few years, the collections may be so arranged and displayed as to bring to even the careless stroller lessons not only of beauty, but also of wisdom, opening his eyes to some of the great truths of the world of life."

What nobler aims, for which to work and to sink all minor differences, than these, *the welfare of man and the happiness of the people?* Let these be our watchwords, and the evils born of misrule and ignorance shall not prevail.

NOTES.

Prof. R. Meldola, F.R.S., has been elected a member of the Athenæum Club under the provisions of the rule which empowers the annual election by the committee of nine persons "of distinguished eminence in science, literature, the arts, or for public services."

Lieut. E. H. Shackleton will describe his recent Antarctic achievements at a meeting of the Royal Geographical Society to be held in the Albert Hall on June 24.

In reply to a question asked by Sir Philip Magnus in the House of Commons on Monday with respect to the administration of the natural history collections of the British Museum, the Prime Minister said he is in communication with the trustees of the British Museum upon the subjects.

On Tuesday next, May 4, Prof. Svante Arrhenius will begin a course of two lectures at the Royal Institution on "Cosmogonical Questions." These are the Tyndall lectures. The Friday evening discourse on May 7 will be delivered by Major Ronald Ross, on "The Campaign against Malaria," and on May 14 by Prof. George E. Hale, on "Solar Vortices and Magnetic Fields."

Lord Avebury will take the chair at the annual conversazione of the Selborne Society, which will be held on May 7 at the offices of the Civil Service Commission (Old London University). Two lectures will be given, the first on "How Birds Fly," by Mr. F. W. Headley, and the second on "How Men Fly," by Mr. T. W. K. Clarke. Mr. James Buckland, the original promoter of the Plumage Bill, will exhibit a number of lantern-slides illustrating the birds that are in danger of extermination in various parts of the world. There will also be a display of microscopes and natural-history exhibits.

The Home Secretary has appointed a departmental committee to investigate and report on the best means of standardising with greater accuracy than at present the apparatus and materials employed in the Abel heat test for explosives, and to examine and report on any supplementary test or tests that may be submitted. The committee is constituted as follows:—Major Aston Cooper-Key, Sir Frederic L. Nathan, Captain A. P. H. Desborough, Mr. F. W. Jones, Captain M. B. Lloyd, Mr. C. O. Lundholm, and Major J. H. Mansell, R.A. The secretary of the committee is Major H. Coningham, R.A., to whom correspondence may be addressed at the Home Office.

The Lisbon correspondent of the *Times* reports that a severe earthquake occurred in Portugal on April 23 about 5 p.m. Reports from up the Tagus show that serious damage has been done in the neighbourhood of Salvaterra, Benavente, and Samora, midway between Lisbon and Santarem. The shocks, which in Benavente extended over three hours, lasted at Lisbon from three to fifteen seconds. A Reuter message from Madrid states that earthquake shocks were registered there on April 23, and also at the towns of Valladolid, Huelva, Val de Peñas, Jerez, Villamanrique, Malaga, and other neighbouring places. The movement registered at the Ebro Observatory lasted 5h. 49m.

The committee for the forthcoming International Aëronautical Exhibition at Frankfort-on-Main is making great efforts to ensure the success and attractiveness of the undertaking. By the middle of April the amount of the guarantee fund, 50,000*l.*, was over-subscribed, and the sum of 6500*l.* had already been promised for prize competitions. Prizes of 500*l.* each are offered (1) by Count Zeppelin for the smallest dirigible balloon which shall make at least five journeys of not less than half an hour's duration, returning to the starting point without intermediate landing, and carrying at least two men; (2) by Dr. Gans Fabrice to anyone who has made the greatest number of flights of more than five minutes' duration; (3) by Baron Krupp von Bohlen-Halbach, the conditions to be arranged by the committee. An ornithological exhibition for the representation of natural flight is being prepared by the Senckenberg Philosophical Society, with the assistance of Prof. Schillings.

An investigating party sent out by the Government at Manila has obtained further particulars of the death of Dr. William Jones, reported in our issue of April 15. It appears that, in returning to the head-waters of the River Cagayan in order to obtain boats, he unwittingly crossed a "dead line" that had been established by a hostile tribe. He was met by a party of warriors, who offered him a dish of fish as a token of defiance, in accordance with tribal custom. Not suspecting that he was thereby accepting their challenge, he ate the fish, and was immediately attacked. He managed to fight off his assailants with his revolver until he could reach a boat, in which he escaped, but he died five hours later from his wounds. His body was rescued by friendly natives. The investigating party has recovered the valuable ethnological collection made by Dr. Jones during his two years' stay in the hills, and it will be sent to the Field Columbian Museum in Chicago.

The Berlin correspondent of the *Westminster Gazette* gives in the issue of April 22 a *résumé* of an article published by Prof. O. Lehmann in the *Berliner Tageblatt*, in which is described the principal conclusions arrived at as the result of his long series of investigations of the properties of liquid crystals and the observations upon which they are based. The subject has already been discussed in Nature for January 7, and attention was directed to the part that liquid crystals appear to play in the growth of living organisms. Prof. Lehmann is so fully alive to the far-reaching importance of his discoveries that he endeavours to arouse popular as well as scientific interest in them. To the general public without knowledge of the phenomenon of double refraction and of the crystalline symmetry which it portends, the fact that a substance possessing the mobility of a liquid should at the same time display polarisation effects which were supposed to be peculiar to rigid structures would seem of little importance, but, when it appears that these curious liquids may in some way be connected with the origin of life, the question ceases to be merely academic.

Captain Henry Toynbee, whose death was recorded in the *Times* of April 22, was born on October 22, 1819. He entered the mercantile marine at the age of fourteen, and followed the sea until 1866. In the following year he accepted the appointment of superintendent of the marine branch of the Meteorological Office. It was in this capacity that most of his scientific work was done, though he had published a number of papers on meteorological, astronomical, or geographical subjects before his retirement from active service. The office had been founded in 1854 for the express purpose of dealing with marine meteorology, and at the time when Toynbee joined it, sufficient data had accumulated to enable a commencement to be made with the publication of average values for the various elements. Among the kest-known publications with which his name is associated is a very detailed discussion of the meteorological data for "Square 3" (lat. 0° to 10° N., long. 20° to 30° W.), issued in 1874. This area, lying in the region where the two trade winds meet, is one of special meteorological interest, and the discussion is probably the most detailed that has been attempted hitherto for any oceanic area of equal size. Two years later a somewhat similar, but less detailed, survey of the area between lat. 20° N. and 10° S., and long. 10° W. and 40° W., was issued. This work marked an epoch in the application of meteorology to practical life, for it gives in concise form much information necessary for determining the routes to be followed by sailing ships crossing the equator if they wish to take full advantage of the most favourable winds and to avoid, so far as possible, the equatorial belt of calms. Toynbee retired from the Meteorological Office in 1888, on attaining his seventieth year.

The death of Dr. Simeon Snell, president of the British Medical Association, during his tenure of this important office, and at the early age of fifty-seven, has created a painful impression. Widely known for many years as an assiduous contributor to societies and journals of ophthalmology, his observations have been recognised as of quite exceptional value and importance. A man of wide sympathies, he wielded a great influence in the intellectual life of the city of Sheffield, wherein his ophthalmic practice was conducted, and established many friendships with men of science who visited Sheffield to deliver lectures under the auspices of its Literary and Philosophical Society. His endeavours, both as quondam president and long as secretary of this society, served to maintain the usefulness and reputation of one of those active local associations such as formed the origin of the British Association for the Advancement of Science. In Sheffield he was also recognised as one of the most indefatigable workers in the development of the city university. Outside his own locality, thoroughly practical man as he was, he was well known for contributions to practice and to knowledge arising from work conducted within it. This great centre for the manufacture and manipulation of steel afforded unlimited opportunities for the treatment of eye injuries produced by splinters of metal, and Dr. Snell was the first to elaborate the use of the electromagnet for their removal. Placed in the centre of a large colliery district, his attention was early directed to those peculiarly embarrassing rotations of the eyeball which characterise the disease known as "miners' nystagmus." Whatever may be the cause of this disease, Dr. Snell's monograph on the subject, and the carefully observed conditions described by him as modifying the frequency of its occurrence, will remain as the basis of suggestions and as testimony to the true scientific spirit of medical practice.

An excerpt from the *Harvard Graduates' Magazine*, December, 1908, gives particulars of the expedition which the Harvard Observatory is sending to the elevated plateau of South Africa in charge of Prof. S. I. Bailey. The primary object is the determination of the character of the climate, with the view of finding an ideal site for an astronomical observatory. The first requisite for an astronomical station is a clear sky, free from cloud, haze, smoke, and dust. Since no locality is entirely free from clouds, it is very desirable that those clouds which do occur should be distributed fairly evenly throughout the year, rather than condensed into one decidedly "cloudy season," a condition which prevails in many countries. An ideal station would have freedom from strong winds, a small annual, and especially a small diurnal, range of temperature, low humidity, a reasonable altitude, accessibility, together with the necessaries and some of the comforts of modern life. For the present purpose, also, a station not much less than 30° south of the equator is desired, in order that the entire southern sky may be studied to the best advantage. Such meteorological reports as have been published, together with the accounts of various observers, indicate that excellent conditions for astronomical work exist on the tableland of South Africa. The altitude, which varies from 4000 feet to 6000 feet, is sufficient for the purpose. The records which have been published, however, give only a portion of the data which are needed. The problem can be settled only by a careful study, lasting through one year at least. The present expedition will endeavour to carry out this investigation. In addition to the study of climate, various astronomical investigations will be undertaken. A 10-inch visual telescope, provided with a Rumford photometer, will be used for the measurement of the magnitudes of a large number of stars, among which are sequences of standard stars in selected areas, sequences of comparison stars for southern variables, and so on. A pair of small photographic lenses will also be provided, carried on a single mounting. These are of different focal lengths, and of wide angle. They will be used in certain pieces of routine work, but especially to photograph the faint extensions of the Milky Way and other nebulous regions of the southern sky.

A leading New England paper, the *Springfield Republican*, recently devoted an editorial article to the subject of the popularising of scientific knowledge, as suggested by a speech of Mr. Balfour's a few weeks ago. According to the American writer, the supply is not equal to the demand. "Magazine editors who try to offer their readers first-rate work are in despair for lack of qualified writers. Newspaper editors who glean instructive notes for their columns find a deluge of the hasty, the superficial, the inaccurate, but seldom come upon really competent and well-written work." As to men of science themselves, their habits of intense and concentrated application make them impatient of popular writing. "They are experts, and when they write they write for experts. They think habitually in technical terms, and when it comes to explaining matters to an outsider they do not know where to begin." The *Springfield Republican* offers a practical suggestion to meet the difficulty. There should be established in some university a post-graduate "department of scientific interpretation," open to young men with a literary gift and an interest in science, but too versatile and active minded to make good specialists—men who had already passed through scientific and mechanical courses in their undergraduate years. "The head of their department, if only his services were available, would be Prof. Thomas H. Huxley." The purposes to be especially kept in view in their training would be "the acquirement of method, a clear comprehension of scientific principles, a broad survey of current scientific work, comprehension of the scientific type of mind, the ability to understand men who cannot explain themselves, the technique of simplifying, elucidating, illuminating by simile and analogy." The *Republican* is confident that a training of this kind would be an excellent preparation for all kinds of writers for the Press. "They would be ground between scientific accuracy and the demand for intelligibility as between the upper and the nether millstone, and if they did not emerge a finished product it would not be the fault of the process."

Mr. E. Thurston's paper on "Native Man in Southern India," delivered before the Royal Society of Arts on March 25, is a popular and anecdotal *résumé* of a subject already dealt with by him in his "Ethnographic Notes from South India," and the Bulletins of the Madras Museum, of which he is curator. He points out that while the population of the Tamil country and Malabar is dolichocephalic, that of the more northern districts is mesaticephalic or sub-brachycephalic. He declines to enter into a discussion of the causes which may have led to this variance of race type, and he thus tacitly rejects the theory of Sir H. Risley, that the short-headed people of the southern Deccan represent a Scythian immigration from northern India. Mr. Thurston gives interesting details of some curious customs—the dilation of the ear lobes among Shânan women; the rule which forbids women to drape the breast; the use of leaf garments; and the gradual rise in status of the primitive jungle man, who nowadays makes a caste mark on his forehead with ashes or anilin dyes, and uses lucifer matches in lieu of the old method of obtaining fire by friction. It is shown that it is a popular misconception to suppose any of the non-Aryan tribes to be woolly-haired, and the puzzling appearance of the cross-bow as a weapon among the Ulladans of Travancore is proved to be the result of Portuguese influence.

We have received cuttings of several articles from the *Melbourne Argus*, in which Mr. J. W. Barrett describes the experiences of a party of tourists interested in natural history who made a new year's trip to some of the small islands in Bass Strait. One of the features of the excursion was a visit to the seal-rocks at Westernport, where the seals which formerly frequented several of the islands alone survive. It has been suggested that the numbers of these animals should be reduced, on account of supposed future injury to the fisheries, but, apart from the fact that they do not usually eat fish, the writer points out that their numbers have probably not altered appreciably for centuries, and that the "balance of nature" is almost certain to be maintained in the future. The trip also included an inspection of the wonderful breeding-colony of gannets on Cat Island, where some 4000 of these birds were nesting at the time of the visit.

The heredity of the colour of hair in man is discussed at considerable length by Gertrude and Charles Davenport in the April number of the *American Naturalist*. As regards the nature of the colouring, the authors consider that there are probably two main types of pigment in human hair, one a reddish-yellow, which finds its highest development in bright red, and the other a sepia-brown, the intensity of which ranges from light yellow to dark brown and black. As the result of a combined study of both eye-colour and hair-colour, the writers finally arrive at the conclusion "that two parents with clear blue eyes and yellow or flaxen straight hair can have children only of the same type, no matter what the grandparental characteristics were; that dark-eyed and haired, curly-haired parents may have children like themselves, but also of the less developed condition. In the latter case what the proportions of each type will be is, for a fairly large family, predictable by a study of the immediate ancestry."

We have received from the Bureau of Entomology of the United States Department of Agriculture a paper by Mr. J. J. Davis containing biological studies of three species of Aphididæ, the corn-root aphis (*Aphis maidi-radicis*, Forbes), the corn-leaf aphis (*Aphis maidis*, Fitch), and the sorghum aphis (*Sipha* [*chaitophorus*] *flava*, Forbes). The life-cycle of the aphis is very curious, no fewer than five forms being recorded for the corn-root aphis, viz. winged viviparous females, wingless viviparous females, oviparous females, males, and eggs. From the eggs some ten to twenty-two generations of viviparous females follow, but the last generation of the season consists of oviparous wingless females and males, which pair, and the females produce eggs. Evidence is adduced to show that external conditions of temperature, &c., determine whether a particular generation is to be viviparous or oviparous; it is considered that aphides could reproduce parthenogenetically for an indefinite period if the environment was favourable. The biological problems involved are of great importance. Bulletin No. 66, by F. H. Chittenden and H. M. Russell, deals with the semi-tropical army worm (*Prodenia eridania*, Cram.), a hairless caterpillar doing much damage to market-garden crops. Arsenical sprays were found to be effective against it.

Mr. C. Baker, of 244 High Holborn, London, W.C., has issued his quarterly classified list of second-hand scientific instruments for sale or hire. He offers a very large stock of microscopes and microscopic apparatus which, as in the case of all instruments catalogued, have been inspected and where necessary repaired. The list also contains a varied selection of surveying instruments and other apparatus classified under eight sections.

THE report of the commission for the flora of Germany regarding new localities for plants recorded during the years 1902 to 1905 has been published as a supplement to last year's volume of the *Berichte der deutschen botanischen Gesellschaft* (vol. xxvi., A). It is a continuation of the reports issued as part of the supplements to the twentieth and earlier volumes of the *Berichte*, but is confined to phanerogams. The arduous task of compilation has been undertaken by Prof. K. W. von Dalla Torre. As in previous reports, the systematic list of records is arranged according to the floras of Koch and Garcke, and is preceded by a bibliography of publications consulted.

THE notes contributed by Mr. J. E. C. Turner to the *Indian Forester* (February) on the germination of myrabolan seedlings, *Terminalia chebula*, are of interest, as the conditions must be somewhat similar in the case of not a few drupaceous fruits yielded by trees. Some myrabolan fruits are plump and round, others are strongly ridged; the latter are preferred commercially, but the former are recommended for propagation. The ridges are due to the shrinking of the mesocarp, which causes also the tighter and more solid encasement of the seed. The fruits are sometimes penetrated by a fungus which reduces the mesocarp to powder; in this case, or when for other reasons the mesocarp does not shrink, the fruits remain round, and at germination the embryo has little difficulty in emerging.

AN important contribution to the classification of the Geoglossaceæ, a family of ascomycetous fungi, has been furnished by Dr. E. J. Durand, who has published in the *Annales Mycologici* (vol. vi., No. 5) a systematic account of North American species. It is based on the examination of many type-specimens and duplicates in American and European herbaria, and is fully illustrated with outline drawings and photomicrographs. Two groups are distinguished, the Geoglosseæ, mostly clavate, like a simple type of Clavaria, and the Cudonieæ, mostly pileate. Under Geoglosseæ seven genera are identified, including Microglossum and Corynetes for the hyaline-spored species, and a genus, Glœoglossum, for species of a viscid, gelatinous consistency. The Cudonieæ are arranged under the four genera Leotia, Vibrissea, Apostemidium, and Cudonia. Confirmation is given to the researches of Dittrich that the young hymenium of many species is covered by a veil, comparable to the "volva" of the agarics; it is best seen in *Cudonia lutea* and *Spathularia velutipes*.

THE report of the East Kent Scientific and Natural History Society for the year ending September, 1908, contains the presidential address delivered by Mr. S. Harvey at the commemoration of the jubilee of the society. Among the notes there is reference to the discovery of *Salvia verticillata* near Dover, where, according to the Rev. J. Taylor, it appeared to be well established; this plant is not listed in Hooker's "Student's Flora" or in the "London Catalogue," but is given in Dun's "Alien Flora of Britain." Another interesting find, made by Mr. W. R. Jeffery on Westwell Down, was an apparent hybrid between *Verbascum Lychnitis* and *Verbascum Thapsus*. The hybrids were much taller than the species, produced inflorescences similar to *Lychnitis*, but bore yellow flowers like *Thapsus*.

DR. L. RITTER VON SAWICKI publishes a discussion of the vexed problem of the Rhine-Rhone water-parting in the *Zeitschrift* of the Berlin Gesellschaft für Erdkunde. The main conclusions at which he arrives are four in number:—(1) the present Rhine-Rhone water-parting was formed during the Quaternary period, and destroyed the unity of the former system which flowed to the Rhine; (2) it was formed by a displacement of the old divide caused by lowering of the Geneva basin. This lowering (3) can be correlated with the levels of inter-Glacial times; (4) the "Bühl" period is an important epoch in the glacial time, and on the Lake of Geneva it can be divided into at least three phases, of which the second is the most important.

THE International Council for the Exploration of the Sea has issued a supplementary part of the "Bulletin Trimestriel" for 1906–7, containing a *résumé* of the observations made and the results obtained in the areas under investigation. The region is divided into eight sections:—the Gulf of Bothnia, the Baltic (including the Gulf of Finland, the waters between Rügen and Scania, and the Baltic proper), the Belts and the Kattegat, the Skagerak, North Sea and English Channel, the Irish Sea, the Atlantic, the Norwegian Sea, and the Arctic Sea, and in each case a short description is given of the general distribution of temperature and salinity. Twenty-three plates giving mean values from August, 1902, to May, 1906, accompany the memoir, which is invaluable as marking a stage in the discussion of the vast quantity of material acquired by the council. It is obviously impossible to give, in the space at our disposal, even a short abstract of the results stated; suffice it to say that in each subdivision marked progress has been made in the elucidation of the difficult problems of surface and under-surface circulation.

THE Bulletin of the Imperial Society of Naturalists of Moscow (vol. xxi., No. 4) contains a detailed and valuable discussion, by Dr. E. Leyst, of the meteorological observations made in 1907 at the observatory in connection with the university of that place. Observations are made thrice daily, and these are used as standards for checking the hourly tabulations from the self-recording instruments, of which the observatory possesses a very complete set. The year 1907 was about 2°·2 F. below the normal; the mean was 36°·9; January 4°·6, July 65°·5. The extreme readings were 85°·3 and −27°·2; the absolute extremes during the last fifteen years were 96°·3 and −34°·6. Only 198 days in the year 1907 were quite free from frost. The rainfall, &c., amounted to 20·87 inches, the number of days being 209; the amount was normal, but the average number of days of precipitation is 171. The hours of bright sunshine numbered nearly 1300—about the average for the north-east of England. Although the results are not published in this summary, the observatory records earthquake phenomena, observations of atmospheric electricity, and terrestrial magnetism. The investigation of the upper air has been temporarily suspended for want of funds.

WHEN carbon, metals, or metallic oxides are heated in a vacuum they give out negative electrons, and expressions for the number of electrons emitted in a second, the electric charge they carry, and the energy with which they leave the surface from which they are emitted, have been given by Profs. O. W. Richardson and H. A. Wilson. Part iv. of the *Verhandlungen der deutschen physikalischen Gesellschaft* contains an abstract, and part iii. of vol. xxviii. of the *Annalen der Physik* a complete account, of the measurement of the energy of these electrons recently made by Drs. A. Wehnelt and F. Jentzsch, of the University of Berlin. They measure the energy necessary to keep the temperature of a platinum wire covered with calcium oxide constant, first when electrons are, secondly when they are not, emitted by the surface. They find the agreement between theory and experiment altogether unsatisfactory, and conclude that the present theory is not a correct representation of the phenomena of emission of electrons from glowing bodies.

The March number of *Terrestrial Magnetism and Atmospheric Electricity* contains an abstract by the author, Dr. L. A. Bauer, of the report recently issued by the United States Coast and Geodetic Survey, dealing with the results of the magnetic survey work in the country up to 1906. This report is the most complete summary published up to the present, and supersedes previous reports. The stations used in the survey are on the average thirty-one miles apart, and the charts cover a considerable area of the surrounding ocean. All values relate to 1905 January 1, and are corrected for diurnal variation. The secular changes in the United States appear to be much more complicated than has been supposed hitherto, and if cyclic must have subperiods as well as a principal period. Dr. Bauer is already examining the data with the view of determining what part of the magnetic field is referable to a potential, and hopes to base other investigations on the material the report supplies.

The *Journal of Physical Chemistry* has during recent months been occupied largely by a series of papers by Prof. Bancroft on the electrochemistry of light. In the fourth and fifth papers of the series the "problem of solarisation" is discussed at length, the two papers covering ninety pages of the January and seventy pages of the March issue. Bulky quotations are given from the original literature, and the monograph therefore does for one branch of modern scientific work the same service that Ostwald has performed by reprinting various classics of exact research. The February number will be read with interest, as it contains Kahlenberg's reply to the criticisms of Cohen and Commelin of his work on the osmotic pressure of solutions in pyridine with a rubber membrane. It will be remembered that Kahlenberg obtained pressures for inferior to those deduced by means of the gas-equation; Cohen and Commelin, with an improved apparatus, also failed to reach the calculated pressures, but attributed their failure to experimental imperfections. In the present communication the validity of the original experiments is maintained, but no new evidence of importance is brought forward.

One of the principal machines to which the requirements of a modern boiler-house have given birth is the automatic recorder of carbon dioxide. Such recorders are devised to take samples of the flue gases at intervals of, say, two or four minutes, analyse them for the percentages of CO_2, and record the results on a chart driven by a clock. A continuous record is thus obtained throughout the whole period at which the boilers are at work, and is of value in showing whether proper conditions for maintaining complete combustion have been preserved. As the record is visible at all times, stokers rapidly learn to preserve economical conditions. Some tests on the Simmance-Abady combustion recorder have been made recently by Mr. Rosenhain at the National Physical Laboratory, and are commented on in *Engineering* for April 16. Samples giving 4·99 per cent. of CO_2 by the Sodeau hand analysis apparatus were recorded by the automatic instrument as 4·91 per cent., the draught being 0·75 inch of water. This result corresponds to an avoidable loss in fuel of 32 per cent. Another sample, showing 9·09 per cent. by hand test, was automatically recorded as 8·98 per cent., the avoidable loss of fuel in this case being 10 per cent. Another sample, showing 15·88 per cent. by hand test, was recorded as 15·39 per cent.; this percentage represents the highest possible under economical working with bituminous coal. Taking the mean of all the tests, the recorder was less than half of 1 per cent. low. As the charts are graduated to read to 1 per cent. only under ordinary conditions, the results of the trials must be regarded as extremely satisfactory for this recorder.

A paper on problems connected with the construction of the *New York Times* building was read by Mr. C. T. Purdy before the Institution of Civil Engineers on April 20. The Underground Railway passes through the basement of the building, and the paper describes the special features of the steel construction due to the existence and operation of the railway. The height of the building from the pavement to the twenty-third storey is 329 feet, and above this is an observatory and lantern, the roof of which is 30 feet higher; the basement storeys extend 48 feet below the level of the sidewalk. The total dead weight of the building is 33,611,000 lb. (15,000 tons). The problem of vibration arising out of the Underground Railway needed special treatment. In addition to making the structure of the subway independent of the building, it was arranged to found the supporting columns of the former on cushions of sand, and thus still further to insulate the building. The results at first were quite satisfactory, and no vibration was felt from passing trains; but later distinct vibration was detected, and at last this became very pronounced. Seismograph observations were taken, and a thorough examination of the two structures was made. The trouble disappeared when the railway company re-laid the tracks through the building, all perceptible vibration then ceasing. The author considers, nevertheless, that the insulation of the two structures and the provision of the sand-cushions for the subway columns have a material effect in producing this result. Under many conditions such insulation of structural members would be the most effective and economical method of preventing vibration. It is stated that it was certainly efficient in the new building, which has four railway tracks through it, and often three or four trains in the building at the same time, some stopping and others passing through at high speeds.

OUR ASTRONOMICAL COLUMN.

Astronomical Occurrences in May:—

May 1. 12h. Jupiter stationary.
5. 9h. 43m. Satellite III. occulted by Jupiter, reappearance 13h. 12m.
5. Red spot visible on Jupiter's disc between 8h. and 9h.
7. Red spot visible on Jupiter between 10h. and 11h.
13. 3h. Mars at quadrature to the Sun.
16. 3h. 33m. Satellite III. transits Jupiter's disc, egress 7h. 3m.
19. 11h. 34m. Venus in conjunction with the Moon (Venus 1° 6′ N.).
20. 4h. Mercury at greatest elongation E. of the Sun (22° 22′).
23. 7h. 28m. Satellite III. transits Jupiter, egress 10h. 57m.
26. 11h. 5m. Jupiter in conjunction with the Moon (Jupiter 4° 13′ S.).
26. 23h. Jupiter at quadrature to the Sun.
30. 11h. 27m. Satellite III. transits Jupiter, egress 14h. 56m.

The Meteoric Shower of Halley's Comet.—Mr. W. F. Denning writes:—

"The stream of meteors radiating from near η Aquarii in the mornings between May 1 and 6 should be looked